NOTES ON BREEDING BEHAVIOUR OF THE NORTH ISLAND SADDLEBACK

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INTRODUCTION

On 9/11/65 a party visited Hen Island with the object of making a further study of the food and feeding stations of the Saddleback *(Philesturnus carunculatus refusater),* and if possible to make observations on breeding behaviour of the species, concerning which little seems to have been recorded in the literature. The party consisted of D. V. Merton (DVM), of Wildlife Division, leader, Dr. M. F. Soper (MFS) and Mrs. Soper (JS), G. H. Moon (GHM), N. J. Ledgard (NJL), R. T. Lawrence (RTL), and the writer (AB). The date of the visit had been arranged so that we would be on the island, as we hoped, at the peak of the Saddleback's breeding season; but in the event it became obvious that the first nesting was well over, for many pairs were noted with single fledglings, never more, some of which were reaching the stage of independence. The behaviour of many pairs seemed to indicate that a second nesting was contemplated, and we eventually found some in the process of building, and finally some with eggs. Other species were at the peak of nesting, for we found several nests, containing either eggs or young, of the Pigeon *(Hemiphaga novaeseelandiae)*, Kaka *(Nestor meridionalis septentrionalis)*, Morepork *(Ninox novaeseelandiae)*, and Fantail *(Rhipidura fuliginosa placabilis)*, and nests of Bellbird *(Anthornis m. melanura)*, Tui *(Prosthemadera novaeseelandiae)*, and Blackbird *(Turdus merula)* were numerous. Independent young of the Bellbird and Tui were particularly abundant. A pair of Pied Tit *(Petroica macrocephala toitoi)* near the campsite had flying young, and were rebuilding.

NEST BUILDING

It was not until the third day on the island that any indication of nesting was observed. DVM then noted a female on the ground tearing large strips of bark from a kanuka root, with which it flew directly into the dead detritus at the base of a large mass of the epiphytic *Collospermum hastatum.* This was situated on the bough of a pohutukawa, at about 50 feet from the base of the tree; but being on a steep slope, the nest was only 20 feet above eye level from the top of the slope. The bird was observed to take nesting material to the site at intervals of about six minutes, and to remain hidden in the dead growth for about a minute. The material was gathered from various situations close to the site, and this was later identified, at least in part, as consisting of the inner bark of the lacebark and shreds of dry astelia leaves; and at least twice of spider web gathered from knot holes. Building was observed each morning of the 11th, 12th and 13th, but never after about 1300 hrs. The approach to the site was invariably made from one side of the astelia clump, and the exit from the other. The male took no part in these operations, but usually accompanied the female whilst she was on the ground, and frequently fed her when she left the nest site. He made threat displays to Bellbirds within 40 feet, and drove off a Tui which had approached within 12

feet. On the afternoon of the 15th, JS observed that the female was on the nest for 40 minutes, when she left it, to return 8 minutes later. From subsequent observations at another nest, it can be assumed that the bird was now brooding, having laid the first egg on the 14th, and the second the following morning. The nest site was quite inaccessible.

A used nest containing eggshell remains was found on 11/11/65 by AB. The site was 2 feet from the ground, in a dense mass of coppice shoots at the base of a puriri tree. The foundation of the nest consisted of small kanuka twigs, the nest itself being wholly composed of strips of inner bark of the lacebark.

Early in the morning of the 12th, MFS and JS noted a female Saddleback looking very bedraggled, with a large piece of eggshell and fragments of nesting material adhering to her breast feathers. They watched her preening, during which she ate two breast feathers; and the fragment of shell was recovered, and identified as Saddleback egg. Later that morning, JS discovered in the vicinity a fresh unoccupied nest. It was placed in a cleft in the rock just below the top of a seaward cliff face, and a large number of feathers from the tail coverts of a Saddleback were found a few feet below the nest. The cause of the accident was unknown; but petrels in variety were coming in at night to their burrows, and one of these may have landed on the sitting bird. More probably, it happened during the early morning take-off, although the rock cleft gave adequate overhead cover to a sitting bird. The nest was constructed with a base mainly of kanuka twigs up to 8 inches long, with some rotted pieces of cabbage tree fibre and renga lily leaves, a few pieces of pohutukawa root, some dead leaves of mahoe and pohutukawa, and a substantial puriri twig. The nest itself was made entirely of the soft inner bark of the kanuka, except for a few strips of inner bark of the lacebark. The inner diameter measured 95 mm and the depth 40 mm.

On 14/11/65 another female was noted carrying material to a nest site in a large puriri tee, at 16 feet above ground level (DVM). When first observed, the female had just joined the male at 40 feet in a tall mahoe. He fed her three times, and then she flew to the ground and gathered a beakful of twigs, aerial rootlets of pohutukawa, and a large mahoe leaf. She dropped this material, and both birds flew to the nest hole, which she entered, while the male flew back and forth for a minute or so. She then set about gathering more material. During a watch at the site next morning, the female was seen to take material, mostly pohutukawa rootlets and a few skeleton leaves, to the nest at intervals of about two minutes. All material was gathered from an area of a few square feet, and the approach route to the nest did not vary. Although the site was extremely difficult of access, an inspection was made on the afternoon of the 16th, when building appeared complete, the nest being lined with inner bark of kanuka.

BROODING BEHAVIOUR

Also on the 14th, NJL and RTL kept watch on a male bird, and at times a pair, for three hours, and finally traced the female to a nest hole in the trunk of a pohutukawa on the coastline, the hole being only some 10 feet above high tide mark. During their watch, they had seen the male feeding the female at intervals, and the nesting place was revealed by the male flying to the hole, but not entering it.

A few minutes later the female flew straight into the hole, where she remained for 20 minutes, then reappeared, preened briefly, and flew off. Investigation on the 15th revealed that she was sitting on two eggs, and that the nest had the usual lining of inner kanuka bark. It was sited about 18 inches from the entrance. The same day a hide was erected 8 feet from the nesting hole, and from 0600 hours on 16/11/65 a continuous daylight-to-dark watch was kept.

An interesting rhythm of behaviour on the part of the female now began to reveal itself. Each member of the party kept a two-hour watch in turn, and reliefs were only effected when it was known that the female was firmly settled on the nest. Hatching occurred at about mid-day on the third day of observation, i.e. 18/11/65, after which the pattern of brooding naturally underwent a complete change.

Prior to hatching, the time of the female's first departure varied between 0543 and 0546 hours, and the last for the day between 1811 and 1816 hours. The periods of brooding on the 16th varied between 27 and 59 minutes, the average of 14 such periods during the day being 42 minutes. Times off the nest varied between 8 and 17 minutes, except for the final brief departure of 3 minutes at 1811 hours, giving an average of 12 minutes. During the next day the average period of brooding was 49 minutes, and time spent off the nest averaged 14 minutes. Both days were fine and mild; the next day, although colder with gale force wind, the rhythm remained unchanged until noon, 8 periods of brooding averaging 45 minutes and absences 10 minutes.

The hen's departure was almost invariably silent until she was clear of the immediate vicinity of the nest. On one occasion only, at 0543 hours on the 17th, she gave a succession of four sharp notes, being obviously disturbed by a flash unit used by the observer. On a number of occasions the male called the female off the nest, and several times approached the nest hole with food, when she would emerge to be fed. Typical entries in the field notes are as follows:

0739 hrs. Male gave one low note and appeared in taupata below nest, feeding briefly.
0740 hrs. Male came to point immediately above nest hole, and female emerged. He fed her here 5 times, and both flew into nearby foliage, male giving one brief territory call (AB).
1027 hrs. Male arrived on limb to right of nest hole with food, one green caterpillar obvious. He went to entrance and waited two seconds before female appeared. She begged for food, but he immediately returned to bough, female following. Male then flew off with female following. No calling throughout, and no feeding near nest (DVM).

Normally on emerging, the female would pause at the exit. This could hardly be precautionary, as predators are unknown in the Saddleback's world. It may possibly be to accustom her eyes to the light.

The return to the nest after periods of feeding and preening was extremely rapid compared with the rather more leisurely exit; in fact, it can only be described as darting. Also it was usually vocal, a single sharp note repeated at intervals announcing her return, and given on occasions right up to the point of entrance to the nest. A silent return probably indicated that she was accompanied by the male to the vicinity of the nest, as was demonstrated by several observations.

By midday on the 18th the wind was moderating, and rain showers were frequent. The eggs hatched at this time, and the pattern of brooding changed. Until observation ceased at 0710 hours on the 19th due to departure from the island, there were 21 periods of brooding, which varied between 6 and 28 minutes, and averaged 14½ minutes. Times off the nest varied between 2 and 14 minutes, and averaged

7 minutes. There was no calling by the female on leaving or returning except on two occasions, when she gave a " chee-chee-chee " call, repeated seven times in one instance, the last being given as she entered the hole. Of course she brought food for the nestlings on her return, although rarely was this visible in her bill; but when identifiable, it was seen to consist of minute grubs and small beetles. Not so with the male, as the following extracts from the field notes will show:

1322 hrs. Male appeared on bough, paused, then went to nest opening. Had bill full of insects. After 10 seconds with head just inside hole, he flew off. Female emerged a second later (RTL).

1533 hrs. Without warning male appeared at nest hole with bill full of small insects. Female emerged and both stood at entrance. Female re-entered and male returned to branch, swallowed his insects, gave a low double note call twice, and flew off (JS).

0530 hrs. Male appeared on low taupata bush and gave a soft double note. He then hopped to branch, and facing nest hole gave three or four soft low calls. Female appeared, in crouched begging position, and male passed the food to her. This seemed a glutinous mass. She did not completely close her bill on this, and disappeared into hole. She re-appeared a few seconds later, and flew a short way up the face with male (AB).

No observation was made on the disposal of eggshell, which may have been placed deeper in the cavity.

DISCUSSION

Reischek (1) states that on Little Barrier Island both male and female shared the incubation of eggs and rearing of the young, but it is quite apparent from our observations that the male takes no part whatever in incubation, and that at least in the early stages the female takes full control of the feeding of the nestlings. It was unfortunate that our limited time prevented us from ascertaining at what stage, if any, the male takes a full share in the feeding of the young.

There is an almost complete lack of knowledge of the breeding habits and behaviour of the North Island race of the Saddleback. Breeding season, rhythm of laying, hatching and fledging periods, care of nestlings, and breeding success all remain to be recorded; although the breeding of birds in captivity at Mt. Bruce Native Bird Reserve should now have given a fair indication of hatching and fledging periods in the wild. At least our preliminary studies have established certain facts under the following headings:

1. *Selection of site.* A wide choice of nesting site is made, but the preferred one is a hollow limb or tree trunk.

2. *Nest building.* All work is done by the female, the functions of the male at this stage being to prevent intrusion by other species, to supply her with some food, and of course to provide the stimulating influence.

3. *Materials used.* These are selected fom those near at hand. Kanuka is everywhere abundant, and so in most cases is used in the foundation, along with pohutukawa rootlets. Oliver (2) states that all four nests recorded from Hen Island were made of kanuka twigs and lined with grass or feathers, or both. We found that the bowl of the nest was in some cases built, not merely lined, with strips of easily obtained soft inner bark of kanuka or lacebark.

4. *Brooding.* This is restricted to the female, and there is no direct feeding of the nestlings by the male, at least in the early stages. During incubation, he frequently feeds the female both at the nest site and elsewhere in the pair's territory.

REFERENCES

1. REISCHEK, A. (1887): Trans. N.Z. Inst. 19, 188/9.
2. OLIVER, Dr. W. R. B. (1955): New Zealand Birds, 514.